

REMARKS

Applicant notes with appreciation allowance of claims 12-20 and the finding that claims 4-11 would be allowed if rewritten in independent form. Those claims have not been rewritten, however, because it is believed that the base claim 1 is allowable for the reasons discussed below.

Claims 1, 2, 3, 21 and 22 have been rejected under 35 U.S.C. §103 as being unpatentable over U.S. Patent 5,368,038 (Fraden) in view of US Patent 4,198,861 (Mung-Kuen Luk). The rejection is respectfully traversed and reconsideration is requested.

Applicant Exergen Corporation is a recognized leader in the field of radiation temperature measurements with a successful line of products including models for detecting body temperature by detecting ear temperature or axillary temperature. Several such products are discussed in the paragraph bridging pages 14 and 15 of the application.

At the time of conception of the present invention, ear temperature was believed to be a much more reliable indication of body core temperature than, for example, forehead temperature. Prior to conception of this invention, it was not apparent to Dr. Pompei, the inventor of this application and for example prior patent 4,993,419, that reliable temperature measurements could be obtained from the forehead by extending techniques initially developed for the tympanic membrane. It had not been appreciated by those skilled in the art of temperature measurement that the superficial temporal artery, which is offset from the center of the forehead where contact forehead temperature readings are typically made, can provide an exceptionally reliable temperature reading.

Once Mr. Pompei recognized the significance of superficial temporal artery measurement, he had to devise a device and method by which an untrained individual could reliably obtain that temperature reading despite the unreliable surrounding temperatures of the forehead. To that end, he chose to scan the temperature detector across a wide area of the forehead which includes the temporal artery and to take a peak temperature reading indicative of the temporal artery temperature.

A peak temperature technique had previously been used in the tympanic and other ear temperature devices, which were rotated because of the difficulty in assuring that the radiation

detector was directed at the tympanic membrane at the base of the ear canal, and it was discovered that a similar technique could be used to overcome the lack of certainty as to the location of the temporal artery on the forehead. Even if one had considered the temporal artery measurement, the extension of the peak detection technique from a tympanic membrane temperature measurement to a temporal artery measurement would not have been obvious.

Having developed a method which provides the unexpected result of simple and reliable forehead temperature measurements, the method can be extended to other arteries as well.

The primary reference cited by the Examiner, the Fraden patent, relates to an ear temperature detector and thus teaches no more than Applicant's prior ear temperature detector patents.

The Examiner cites Mung-Kuen Luk for a disclosure of a temperature indicator that can be placed on the forehead over an artery. It is submitted that, because ear temperatures were considered to be more reliable than forehead temperatures, one would not be inclined to modify the ear detector of Fraden for a forehead measurement.

Not only would one not combine the two references, but even when combined, the references do not teach the claimed invention. In particular, neither reference teaches "electronics which measure peak temperature from at least three readings per second during scan.....across an artery" or a temperature display "based on a model of heat balance relative to a detected arterial temperature" as recited in claim 1. Further, neither teaches the claimed reflective cup as recited in claims 3 and 21.

The undersigned notes column 5, lines 10-19 of Mung-Kuen Luk for use of the indicator over the orbital artery. Mung-Kuen Luk recognized that "location and size of the indication is of some importance." However, few users would be able to accurately center the indicator over an artery. The large size of the indicator would help assure that some portion overlaps the artery, but as a result, the surrounding tissue would contribute to the measurement. An artery is typically about 1mm in diameter and, judging from Fig. 4 of Mung-Kuen Luk, the indication is at least about 20 mm. Consequently, the artery would only make about a 5% contribution to the indicated temperature.

Applicant has overcome the difficulty of locating the artery by providing a peak temperature reading from at least three readings per second in an electronic device suited to scan

across the target surface area. In use, the scan can begin from one side of the artery, continue across the artery and end to the other side of the artery. The peak reading during the scan is an accurate indication of the arterial temperature. Such a scan is not suggested by Fraden or any other reference.

The Examiner has pointed to Applicant's prior use of heat balance for that aspect of the claims. However, Applicant's prior heat balance computation, used in both ear detectors and axillary detectors, relied on tympanic, ear canal or axillary skin temperature to compute a core artery temperature that was not being observed. In contrast, claim 1 recites that the displayed temperature is based on a model of heat balance relative to a detected arterial temperature. That is, it is arterial temperature that is detected, albeit through skin, and an interior temperature is based on the detected arterial temperature. There is no suggestion in any of the Applicant's prior teachings of using the heat balance approach when scanning an artery.

The Examiner suggests that the Fraden reference includes the cup of claims 3 and 21. However, the element 24 referenced by the Examiner is inverted relative to the claimed cup. There is no indication that the element 24 is reflective, but even if it were, it would not serve the function of the claimed cup in which the larger open diameter faces the target. Claims 3 and 21 have been amended to more clearly describe the orientation of the claimed cup where the window is at the proximal end of the cup, that is, at the end near to the main housing of the detector, and the larger diameter opening is distal and thus closer to the target surface. It is submitted that, with this clarification of the structure of the claimed cup, the element 24 of Fraden teaches nothing toward the cup. (Although such a cup has been used as presented in the cited U.S. Patent 4,636,091 in industrial applications and for single spot temperatures in human body temperature measurements, that device would not be suitable for scanning of a human body.)

The Examiner also concludes that Fraden processes at least ten readings per second. The undersigned has found no suggestion of that in Fraden. Applicant's prior ear temperature detectors have processed at that rate, but are distinguished for the reasons discussed above.

Disclosure Statement

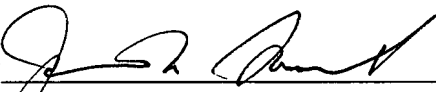
A Supplemental Information Disclosure Statement (SIDS) is being filed concurrently herewith. Entry of the SIDS is respectfully requested.

CONCLUSION

In view of the above amendments and remarks, it is believed that all claims are in condition for allowance, and it is respectfully requested that the application be passed to issue. If the Examiner feels that a telephone conference would expedite prosecution of this case, the Examiner is invited to call the undersigned.

Respectfully submitted,

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